

## ABSTRACT

Disclosed is a hydrogen storage alloy material which is prepared by subjecting an amorphous alloy to a heat treatment in air or an oxygen atmosphere. The amorphous alloy has  
5 a composition, in atomic %, expressed by the following formula: Zr<sub>100-a-b</sub>Pd<sub>a</sub>M<sub>b</sub>(wherein 15 ≤ a ≤ 40, 0 < b ≤ 10, and M is at least one metal selected from the group consisting of Pt, Au, Fe, Co and Ni). The Pd, the metal M and one or more compounds thereof are dispersed in a parent phase of ZrO<sub>2</sub> in the form of ultrafine particles. This alloy material exhibits a hydrogen storage amount of 2.5 weight % or more in a weight ratio relative to Pd contained in the material, and  
10 suited to a hydrogen storage/transportation medium. The alloy material can be produced by preparing a melt of a master alloy formed through a melting process, rapidly solidifying the melt at a cooling rate of 10<sup>4</sup> K/s or more to form the above amorphous alloy, and subjecting the amorphous alloy to an oxidizing heat treatment in air or an oxygen atmosphere at 250 to 350°C to selectively oxidizing the alloy element of Zr so as to allow the hydrogen storage metal of Pd  
15 or a Pd compound to be dispersed in a parent phase of ZrO<sub>2</sub> in the form of nanoparticle-size ultrafine particles.